# PART I - ADMINISTRATIVE

## Section 1. General administrative information

**Title of project**

Nez Perce Tribal Hatchery

**BPA project number:** 8335000
**Contract renewal date (mm/yyyy):** 1/2000 ☐ **Multiple actions?**

**Business name of agency, institution or organization requesting funding**
Nez Perce Tribe

**Business acronym (if appropriate)** NPT

**Proposal contact person or principal investigator:**


| | |
|---|---|
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**NPPC Program Measure Number(s) which this project addresses**
7.4.M, 7.4.M.1, 7.4.M.2, 7.5.B.1, 7.3.B.2, 4.1, & 7.4.F

**FWS/NMFS Biological Opinion Number(s) which this project addresses**
O682 - Endangered Species Act Section 7 Consultation. Biological Opinion. Nez Perce Tribal Hatchery 1998 -2002 Hatchery Operations.

**Other planning document references**
DOCUMENTS CITED IN CHRONOLOGICAL ORDER; SEE REFERENCES FOR COMPLETE CITATIONS:

1) 1987 & 1994 Columbia Basin Fish and Wildlife Program
2) Salmon and Steelhead Production Plan. Clearwater River Subbasin
3) Nez Perce Tribal Hatchery Genetic Risk Assessment
4) Nez Perce Tribal Hatchery Master Plan and Appendices
5) Nez Perce Tribal Hatchery Predesign Study
6) Wy Kan Ush Mi Wa Kish Wit (Tribal Recovery Plan)
8) Selway River Genetic Resource Assessment
9) Supplement to Nez Perce Tribal Hatchery Master Plan
10) Proposed Snake River Recovery Plan
11) NPTH Monitoring & Evaluation Plan

12) NPTH Broodstock Management Plan
13) Final Environmental Impact Statement.

**Short description**
Implement construction of Nez Perce Tribal Hatchery supplementation program to assist in the recovery and restoration of non-listed spring chinook and coho salmon and ESA listed Snake River fall chinook in the Clearwater subbasin.

**Target species**
1) Spring/summer chinook, 2) Snake River fall chinook, and 3) coho salmon.

## Section 2. Sorting and evaluation

**Subbasin**
Clearwater

### *Evaluation Process Sort*

| CBFWA caucus | Special evaluation process | ISRP project type |
|---|---|---|
| Mark one or more caucus | If your project fits either of these processes, mark one or both | Mark one or more categories |
| ☒ Anadromous fish<br>☐ Resident fish<br>☐ Wildlife | ☐ Multi-year (milestone-based evaluation)<br>☐ Watershed project evaluation | ☐ Watershed councils/model watersheds<br>☐ Information dissemination<br>☒ Operation & maintenance<br>☒ New construction<br>☐ Research & monitoring<br>☐ Implementation & management<br>☐ Wildlife habitat acquisitions |

## Section 3. Relationships to other Bonneville projects

***Umbrella / sub-proposal relationships.*** List umbrella project first.

| Project # | Project title/description |
|---|---|
| 8335000 | Nez Perce Tribal Hatchery Design, Operations, & Maintenance #8335000 |
| 8335003 | Nez Perce Tribal Hatchery Monitoring and Evaluation |
| 8335001 | Nez Perce Tribal Final Design (completed in 1999) |
| 8335050 | Nez Perce Tribal Hatchery NEPA FEIS (completed 1997) |
| | Nez Perce Tribal Hatchery Construction (Contracted directly by BPA) |

### *Other dependent or critically-related projects*

| Project # | Project title/description | Nature of relationship |
|---|---|---|
| 9403400 | Assessing Summer/Fall Chinook | Will utilize life history and habitat |

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| | Restoration in the Snake River Basin & M&E. | information from this study to guide release strategies and maximize post release survival of NPTH fish. |
| 9801005 | Pittsburg Landing, Capt John Rapids & Big Canyon - Fall Chk Acclimation. | Will provide broodstock development for NPTH and will jointly contribute towards ESA delisting and rebuilding natural fall chinook production in the Clearwater. |
| 9607702 | Lolo Creek Watershed & Habitat | Will protect habitat in NPTH supplementation streams by riparian and instream habitat restoration, fencing, road obliteration and sediment reduction. |
| 9607702 | Lower Eldorado Falls Fish Passage Improvement | Will improve adult passage to access reproductive and rearing habitat in more than 25 stream miles for spring chinook and coho salmon. |
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## Section 4. Objectives, tasks and schedules

### *Past accomplishments*

| Year | Accomplishment | Met biological objectives? |
|---|---|---|
| 1992 | Developed the NPTH Master Plan | Identified production goals based on carrying capacity estimates for each species, coordinated ISS research and other hatchery production programs, provided a sliding scale harvest management plan, provided management concept for information exchange. |
| 1992 | Completed a Genetic Risk Assessment for the NPTH Master Plan. | Identified suitable broodstock sources based on genetic and life history evaluation. Discussed genetic risks from supplementation and recommended strategies to minimize risk. |
| 1993 | Completed the Selway River Genetic Resource Risk Assessment | Identified fall chinook broodstock sources based on genetics, life history, & habitat character. Assessed genetic uniqueness of chk population within the Selway. Discussed genetic risks from supplementation and recommended |

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| | | strategies to minimize risk. |
| 1993 | Outplanted 114,000 spring chinook parr in Meadow Creek, tributary of Selway River. | Evaluated parr supplementation release strategies and post-release survival. |
| 1994 | Completed NPTH Predesign Study. | This study provided preliminary engineering designs and cost estimates for production of spring and fall chinook at several proposed NPTH sites. |
| 1994 | Outplanted 500,000 spring chinook parr in Meadow Creek, Warm Springs Creek & Boulder Creek. | Continued evaluation of parr supplementation release strategies and post-release survival. |
| 1995 | Completed supplement to NPTH Master Plan | Revised Master Plan in accordance with results from genetic risk assessments, the draft M&E plan and predesign studies. |
| 1995 | Completed cultural and archeological surveys | Evaluated cultural and archeological resources at eight proposed facility sites. |
| 1996 | Completed the Monitoring and Evaluation Plan | This is a comprehensive ecosystem based monitoring and evaluation plan to assess interaction between supplemented and natural fish and presents a means to evaluate success of NPTH supplementation. |
| 1996 | Completed the Broodstock Management Plan | This plan discusses genetic monitoring and evaluation based on population sizes and supplementation strategies and presents mating protocols designed to minimize genetic divergence and loss of local adaptation. |
| 1997 | Completed the Final Environmental Impact Statement and Record of Decision | These documents found that "no significant impacts" would result from construction of NPTH and that the planned program was the best alternative to achieving natural spawning restoration goals in the Clearwater. |
| 1997 | Received the Biological Opinion for NPTH. | This document concluded that NPTH would not jeopardize the continued existence of listed species and those proposed for listing. |
| 1997 | Completed the Independent Scienctific Review | NPTH was evaluated successfully for compliance with the NPPC Three-Step Process. Approval was |

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| | | granted to proceed to develop final design, and construction cost estimates. |
| 1997 | Spring chinook broodstock development initiated for NPTH from 1997 broodyear. | Approprate stock spr chk adults (1997), parr (1998) and smolts (1999) were outplanted in NPTH streams. Stocking rates and release strategies were designed around carrying capacity. Returns are expected in the year 2001 when NPTH will be completed. |
| 1999 | Planned completion of NPTH Final Design. | Final Design documents will be presented to NPPC for Step 3 approval in March/April 1999. |
| 1999 | Planned completion of Coho Master Plan ammendment to NPTH. | Document will evaluate potential for restoring coho salmon in Clearwater subbasin using supplementation production through NPTH as well conventional production through existing mitigation hatcheries. |
| 1999 | Planned completion of Fall Chinook Benefit Risk Assessment | Document will evaluate benefits and risks to listed fall chinook of NPTH supplementation in accordance with terms and conditions of the Biological Opinion. |

### *Objectives and tasks*

| Obj 1,2,3 | Objective | Task a,b,c | Task |
|---|---|---|---|
| 1 | Administration, Coordination and Communication | a | Provide quarterly and annual reports to BPA stating accomplished goals and objectives. |
| | | b | Participate in U.S. v. Oregon Production Advisory Committee meetings and in development of annual production report. |
| | | c | Develop any required ESA Biological Assessments and respond to Biological Opinion terms and conditions regarding hatchery production releases interactions with ESA listed fish. |
| | | d | Report project activities and findings at annual BPA/CBFWA reviews and for NPPC as requested. |

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| | | e | Participate in the CBFWA five year Implementation Plan Steering Committee, NPPC Fish and Wildlife Program amendment, and other budget processes. |
| | | f | Monitor, review, and comment on USFS and other land management agency actions in streams and watersheds where NPTH supplementation is occurring and act to protect watersheds crucial to project. |
| | | g | Assist with conservation resource and facility protection through Tribal enforcement division. |
| | | h | Renew/Modify USFS special use permits for satellite sites as required. |
| | | i | Coordinate with NPT Research Division on M&E activities for NPTH and other supplementation projects. |
| 2 | Operations & Maintenance - NPTH facility construction and fish production. | a | As construction is completed, begin new facility management, testing and operations described in facility operations manual. |
| | | b | Continue spring and fall chinook production at interim facilities (Kooskia, Clearwater, Dworshak & Lyons Ferry) for release into NPTH streams and rivers. |
| | | c | Assuming that coho salmon planning is completed, produce coho at interim facilities (Kooskia, Clearwater & Dworshak) for release into appropriate streams. |
| | | d | Continue "on-the-job" and transitional training of NPTH personnel by rearing and caring for fish at state and federal hatcheries. |
| | | e | Continue efforts to acquire broodstock source for spring and fall chinook and coho salmon at Lower Granite Dam and at state and federal hatcheries. |
| 3 | New Construction of NPTH facilities | a | Monitor construction to determine that NATURES biological criteria, |

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| | | | as established in Final Design are being met. |
| | | b | Participate, with BPA and Construction Manager, in oversight of facility construction at; Cherrylane CIRF, Sweetwater Springs CIRF, Yoosa/Camp satellite, Cedar Flats satellite facility, and Meadow Creek adult weir. |
| | | c | Participate, with BPA and Construction Manager, in scheduling facility construction in 2001 at: Newsome Creek, Mill Creek, Luke's Gulch, and North Lapwai Valley satellite facilities. |
| | | d | Provide for cultural resource mitigation during construction of facilities. |
| 4 | Project Planning | a | Refine hatchery production and NATURES rearing methods based on evolving information in the field and monitoring and evaluation results from initial, experimental outplants. |
| | | b | Continue planning necessary (Master Plan, NEPA, biological assessment, facility design and Three-Step process) to evaluate incorporation of coho salmon restoration strategy into NPTH. |
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### *Objective schedules and costs*

| Obj # | Start date mm/yyyy | End date mm/yyyy | Measureable biological objective(s) | Milestone | FY2000 Cost % |
|---|---|---|---|---|---|
| 1 | 1/2000 | 12/2000 | Quarterly reports (3) and one annual report.<br><br>Renew NMFS BA/BO.<br><br>Revise annual operating plan based on NATURES criteria and monitoring and | Submit to BPA.<br><br>Renewed permit.<br><br>Revised AOP. | 15.00% |

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|---|---|---|---|---|---|
| | | | evalauation report | | |
| 2 | 1/2000 | 12/2000 | Fish production at facilities<br><br>Train personnel<br><br>Broodstock acquired | Release parr and smolts.<br><br>Staff training certificates.<br><br>Report egg take. | 35.00% |
| 3 | 1/2000 | 12/2000 | New Construction | Progress report | 35.00% |
| 4 | 1/2000 | 12/2000 | Project Planning | Progress report | 15.00% |
| | | | | **Total** | 100.00% |

**Schedule constraints**
1) Broodstock availibility may limit supplementation and recovery effort,
2) Weather may delay construction process,
3) Cultural resources mitigation may interfere with construction schedule.

**Completion date**
ONGOING; Based on minimum supplementation period of 4 generations or 20 years.

## Section 5. Budget

**FY99 project budget (BPA obligated):** $7,918,036

### *FY2000 budget by line item*

| Item | Note | % of total | FY2000 |
|---|---|---|---|
| Personnel | Project's second construction year. M&E budget not included here. | %3 | 645,805 |
| Fringe benefits | Employees may choose tax exempt. | %0 | 96,909 |
| Supplies, materials, non-expendable property | Supplies and materials combined. | %1 | 140,533 |
| Operations & maintenance | Utilities, rent, training, repair, maintenance, vehicles, leases. | %2 | 311,047 |
| Capital acquisitions or improvements (e.g. land, buildings, major equip.) | Estimate based 30% design, expect reduced cost by 100% design in 1999. | %87 | 17,601,000 |
| NEPA costs | NEPA FEIS completed in 1996-97 may require modification. | %0 | 50,000 |
| Construction-related support | Anticipated construction management and warranty service. | %4 | 842,000 |
| PIT tags | # of tags: NPTH M&E #8335003 covers these expenses now. | %0 | 0 |
| Travel | Portland, Seattle, Boise | %0 | 36,407 |

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| | coordination meetings. | | |
| Indirect costs | 1998 rate reduced from 29.2% to 22.9% | %1 | 257,748 |
| Subcontractor | Project facilitation and planning. | %1 | 207,500 |
| Other | | %0 | 0 |
| **TOTAL BPA FY2000 BUDGET REQUEST** | | | $20,188,949 |

### *Cost sharing*

| Organization | Item or service provided | % total project cost (incl. BPA) | Amount ($) |
|---|---|---|---|
| | | %0 | |
| | | %0 | |
| | | %0 | |
| | | %0 | |
| **Total project cost (including BPA portion)** | | | $20,188,949 |

### *Outyear costs*

| | FY2001 | FY02 | FY03 | FY04 |
|---|---|---|---|---|
| **Total budget** | $6,500,000 | $2,200,000 | $2,200,000 | $2,200,000 |

## Section 6. References

| Watershed? | Reference |
|---|---|
| ☐ | Arnsberg, B. D., W.P. Connor, and E. Connor. 1992. Mainstem Clearwater River Study: Assessment for salmonid spawning, incubation and rearing. Nez Perce Tribe Department of Fisheries 1990 Annual Report to the U.S. |
| ☐ | Department of Energy, Bonneville Power Administration. Contract No. DE-A179-87-BP37474, Project No. 88-15. |
| ☐ | Arnsberg, B.D. and D.P. Statler. 1995. Assessing summer and fall chinook salmon restoration in the upper Clearwater River and principal tributaries. Nez Perce Tribe Department of Fisheries 1994 Annual Report to the U.S. |
| ☐ | Department of Energy,Bonneville Power Administration. Contract No. DE-B179-BI12873, Project No. 94-034. |
| ☐ | Connor, W.P. 1989. Mainstem Clearwater River Study: Assessment for salmonid spawning, incubation and rearing. Nez Perce Tribe Department of Fisheries 1988 Annual Report to the U.S. Department of Energy, Bonneville |
| ☐ | Bonneville Power Administration. Contract No. DE-A179-87-BP37474, Project No. 88-15. |
| ☐ | Connor, W.P., B.D. Arnsber, E. Connor, and C.M. Prewitt. 1990. Mainstem Clearwater River Study: Assessment for salmonid spawning, incubation and rearing. Nez Perce Tribe Department of Fisheries 1989 Annual Report to |

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| ☐ | the U.S. Department of Energy, Bonneville Power Administration. Contract No. DE-A179-87-BP37474, Project No. 88-15. Portland, OR. |
| ☐ | Cramer, S.P. and Neeley D. 1992. Nez Perce Tribal Hatchery Genetic Risk Assessment. Report prepared for the Nez Perce Tribal Executive Committee and the Nez Perce Department of Fisheries Resource Management, Lapwai, ID. |
| ☐ | Cramer, S. P. 1995. Selway River Genetic Resource Assessment. Supplement to Nez Perce Tribal Hatchery genetic risk assessment. Report prepared for the Nez Perce Tribal Executive Committee and the Nez Perce |
| ☐ | Department of Fisheries Resource Management. Lapwai, Idaho. |
| ☐ | Fulton, L.A. 1968. Spawning areas and abundance of steelhead trout and coho, sockeye, and chum salmon in the Columbia River Basin past and present. U.S. Department of Commerce, NOAA, Special Scientific Report Fisheries No. 618. |
| ☐ | Johnson, D.B., R.E. Larson, and C.R. Steward. 1995. Supplement to the Nez Perce Tribal Hatchery Master Plan. Nez Perce Tribal Fisheries. Lapwia, ID. |
| ☐ | Kincaid, H.L. 1997. Nez Perce Tribal Hatchery Genetic Management Plan. Report prepared for the Nez Perce Tribal Executive Committee and the Nez Perce Department of Fisheries Resource Management, Lapwai, ID. |
| ☐ | Larson, R.E. and L. Mobrand. 1992. Nez Perce Tribal Hatchery Master Plan and Appendices. Report to the U.S. Department of Energy, Bonneville Power Administration. Contract No. DE-A179-87-BP36809, Project No. 83-350. |
| ☐ | Lyon, J. 1995. Archeological excavations of nine of the fourteen proposed Nez Perce Tribal Hatchery facility sites. Nez Perce Tribe Cultural Resource Program. Report 95-NPT-3. Lapwai, ID. |
| ☐ | Maynard, D.J., T.A. Flagg, and C.V.W. Mahnken. 1995. A review of seminatural culture strategies for enhancing the postrelease survival of anadromous salmonids. American Fisheries Society Symposium 15:307-314. |
| ☐ | Maynard, D.J., T.A. Flagg, and C.V.W. Mahnken. 1996. Development of a natural rearing system to improve supplemental fish quality, 1991-1995. Progress report prepared for BPA. Project No. 91-055, Contract No. DE-AI79-91BP20651. |
| ☐ | Montgomery Watson. 1994. Nez Perce Tribal Hatchery Predesign Study. Report prepared for the Nez Perce Tribal Executive Committee and the Nez Perce Department of Fisheries Resource Management, Lapwai, ID. |
| ☐ | Nez Perce Tribe and Idaho Department of Fish and Game. (NPT and IDFG) 1990. Columbia Basin System Planning. Salmon and Steelhead Production Plan. Clearwater River Subbasin. September 1, 1990. Prepared by the Nez |
| ☐ | Perce Tribe of Idaho and Idaho Department of Fish and Game. Prepared for the Northwest Power Planning Council and the Columbia Basin Fish and Wildlife Authority. |
| ☐ | Nez Perce Tribe Department of Fisheries Resources Management. (NPT) 1997. Response to questions for the three-step process review of the Nez Perce Tribal Hatchery, dated October 31, 1997. Attachment to letter from |
| ☐ | Samuel N. Penney, Chairman Nez Perce Tribe to John Etchart, Chairman Northwest Power Planning Council dated November 3, 1997. |

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| ☐ | Nez Perce Tribe, Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes of the Warm Springs Indian Reservation, and the Confederation of Tribes and Bands of the Yakama Indian Nation. (Nez Perce |
| ☐ | Tribe et al) 1995. Anadromous fish restoration plan: WY-KAN-USH-MI-WA-KISH-WIT: Spirit of the salmon. Volumes I and II. Columbia River Intertribal Fish Commission. Portland, OR. |
| ☐ | Nothwest Power Planning Council. (NPPC) 1994. 1994 Columbia River Basin Fish and Wildlife Program. Northwest Power Planning Council, Portland, OR. |
| ☐ | Pacific Northwest National Laboratory Ecology Group. 1997. A review of "Response to Questions for the Three-Step Process Review of the Nez Perce Tribal Hatchery". Document prepared for Northwest Power Planning Council Staff dated December 5, 1997. |
| ☐ | Powers, E. 1997. Letter from E. Powers, BPA to W. Stelle, NMFS, dated June 12, 1997, requesting ESA Section 7 consultation, and transmitting a Biological Assessment. |
| ☐ | Robertson, J. 1997. Bonneville Power Administration Nez Perce Tribal Hatchery Record of Decision. Dated October 8, 1997, Portland, OR. |
| ☐ | Ruesink, Robert G. 1997. Nez Perce Tribal Hatchery - Biological Assessment. File #501.1100 1-4-97-I-94. |
| ☐ | Stelle, W. 1997. Letter from W. Stelle, NMFS to E. Powers, BPA, dated November 21, 1997 re: Endangered Species Act Section 7 Biological Opinion on the 1998 - 2002 Nez Perce Tribal Hatchery Operations in the Columbia River Basin [0682]. |
| ☐ | Steward, C.R. 1996. Monitoring and evaluation plan for the Nez Perce Tribal Hatchery. Nez Perce Tribe Department of Fisheries Resources Management, Lapwai ID. Prepared for the U.S. Department of Energy, Bonneville Power |
| ☐ | Administration. Contract No. 87b136809, Project No. 83-350. Portland, OR. |
| ☐ | U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. (NMFS) 1995a. Proposed Recovery Plan for Snake River Salmon. |
| ☐ | U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. (NMFS) 1995b. Biological Opinion for 1995 to 1998 Hatchery Operations in the Columbia |
| ☐ | River Basin. Section consultation with: National Marine Fisheries Service, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Bonneville Power Administration and Bureau of Indian Affairs. |
| ☐ | U.S. Department of Energy, Bonneville Power Administration, U.S. Department of Interior, Bureau of Indian Affairs and Nez Perce Tribe. (BPA et al) 1996. Draft Environmental Impact Statement Nez Perce Tribal Hatchery Program, Portland, OR. |
| ☐ | U.S. Department of Energy, Bonneville Power Administration, U.S. Department of Interior, Bureau of Indian Affairs and Nez Perce Tribe. (BPA et al) 1997. Final Environmental Impact Statement Nez Perce Tribal Hatchery Program. Portland, OR. |

# PART II - NARRATIVE

## Section 7. Abstract

This project (Program Measure 7.4.M) utilizes hatchery supplementation to restore and recover Snake River Basin salmon stocks. Nez Perce Tribal Hatchery (NPTH) is intended to rear and release fall and spring chinook and coho salmon for the express purpose of increasing the natural runs of fish. The program will utilize state-of-the-art techniques to rear salmon that are more like wild fish than those typically reared in hatcheries. It is one of the fifteen high-priority supplementation projects for recovery of Snake River stocks, and its progress, management and outcome are dependent upon analysis conducted under direction of its Monitoring Evaluation Plan.

NPTH goals and objectives and an indication of expected outcome and time frame are:

- Protect, mitigate and enhance Columbia River Basin anadromous fish resources;
- Develop, increase, and reintroduce natural spawning populations of salmon within the Clearwater River Subbasin;
- Provide long-term harvest opportunities for Tribal and non-tribal anglers within four salmon generations following project completion;
- Sustain long-term fitness and genetic integrity of targeted fish populations;
- Keep ecological and genetic impacts to non-targeted fish populations within acceptable limits; and
- Promote Nez Perce Tribal management of Nez Perce Tribal Hatchery facilities and production areas within Nez Perce Treaty lands.

NPTH will encompass three major projects in 2000: Operations and Maintenance, Capital Construction and Monitoring and Evaluation. This proposal (BPA Project 8335000) is the umbrella project and provides the most discussion on project history and purpose. In addition, it will discuss the O&M and construction aspects of NPTH. Beginning with this fiscal year proposal, the NPTH M&E program is assigned a separate BPA Project Number, 8335003.

## Section 8. Project description

### a. Technical and/or scientific background

**Establishing a Need**. The NPTH program responds directly to several needs to restore naturally reproducing salmon within the Clearwater River Subbasin (BPA et al 1997). There is a need to restore salmon as an integral component of the ecosystem. There is a need to develop hatchery supplementation technology that can aid in restoring runs in this and other Columbia Basin watersheds. And finally there is a legal and cultural need to restore this vital resource within the Nez Perce Tribe's treaty lands.

Hydroelectric and flood control dams eliminated most of the Clearwater River salmon. In 1910, construction of the Harpster Dam blocked fish passage into the South Fork

Clearwater. In 1927, Lewiston Dam was built at the mouth of the Clearwater River and prevented passage of spring, summer and fall chinook from at least 1927 to 1940 (Fulton 1970). Passage facilities were upgraded in the 1950's, but counts of chinook salmon between 1950 and 1957 ranged from only 7 to 63 fish, indicating that the indigenous run was probably eliminated (Cramer and Neeley 1992). Harpster Dam was removed in 1963, and Lewiston Dam was removed in 1973, which made most of the Clearwater River once again a free-flowing system. But a year later, in 1974, Dworshak Dam was completed at the mouth of the North Fork Clearwater River resulting in blocked passage from that large river. Meanwhile, efforts to restore a naturally spawning population of spring chinook were somewhat successful and fall chinook have recolonized the lower river, but these runs now face the gamut of obstacles affecting all salmon runs in the Snake River Basin.

There is a biological need to restore salmon back into the Clearwater Subbasin's rivers and streams. Historically, an abundance of salmonids, sculpins, dace and suckers inhabited the Clearwater River (BPA et al 1997). Today the diversity is altered and abundance of salmonids is greatly reduced. The chinook and coho runs are at such low number as to have lost their effectiveness in contributing to ecosystem function. The biological niche of an abundance of young salmon as prey and competitor, and of adult salmon as a nutrient source remains vacant (BPA et al 1997). The loss of biomass provided by large salmon carcasses has made the overall aquatic ecosystem less productive. Aquatic and terrestrial organisms that had evolved to depend on that nutrient source have been affected.

There exists a need to develop new hatchery technology to increase runs of naturally reproducing salmon. Although past reintroduction efforts using hatchery fish have been successful in that a naturally spawning spring chinook component now exists in the Clearwater, the supplementation activities used an array of broodstocks and were applied only in years of hatchery surplus. These programs used conventional rearing and breeding techniques utilized by harvest augmentation facilities, which may be appropriate for the purpose of the facilities, but not as a tool for restoring naturally spawning runs. NMFS' Draft Recovery Plan (1995) and Wy Kan Ush Me Wa Kush Wit (Nez Perce Tribe et al 1995) acknowledged the need to restore natural spawning populations using hatcheries operated specifically for supplementation purposes. NMFS (1995) suggested revising rearing and breeding techniques to improve the quality of smolts, and manipulating water temperatures and diets to emulate natural growth. Studies conducted at their Manchester Lab (Maynard et al 1996) suggest that decreasing rearing densities, using acclimation ponds and voluntary release strategies, and incorporating shade, substrate, cover and structure in rearing containers can increase post-release survival by making fish more like their wild counterparts. Their Natural Rearing Enhancement System (NATURES) techniques have been applied on a limited production scale and many of the harvest augmentation facilities operating today do not have the infrastructure, nor underlying legislative authorization to support rearing fish under these novel conditions.

The Nez Perce Tribe has a legal, historic, economic, social and cultural need to restore salmon runs. The Nez Perce Tribe occupied a territory in what is today north central Idaho, southeastern Washington and northeastern Oregon. The Tribe is a federally recognized tribe with sovereign status over its lands, people and resources and its governmental rights and authorities extend to any natural resources which are reserved or protected in treaties, executive orders and federal statutes. The United States also has a trust obligation toward the Nez Perce Tribe to protect these rights and authorities. Salmon and other migratory fish species are an invaluable food resource and an integral part of the Nez Perce Tribe's culture. Anadromous fish have always made up the bulk of the Nez Perce tribal diet and this dependence on salmon was recognized in the treaties made with the Tribe by the United States. The historic, economic, social, and religious significance of the fish to the Nez Perce Tribe continues to this day, which means that the decline of fish population in the Columbia River Basin has caused a substantial, unique detrimental impact on the Nez Perce way of life. The Tribe is compelled to do what is necessary to restore these salmon runs.

**Finding a Solution**. Nez Perce Tribal Hatchery arises from these many needs and a volume of work has been completed that result in its present program. The Master Plan (Larson and Mobrand 1992) first described the supplementation approach for the facility and identified hatchery production, natural production and harvest goals by species (spring and fall chinook) and candidate supplementation sites on a number of different rivers and streams. Cramer and Neeley (1992) completed a genetic risk assessment which described the genetic, life history and morphological characteristics of naturally spawning spring chinook, fall chinook and summer chinook populations in the Clearwater River Basin. In addition, they described genetic risks of supplementation activities and recommended broodstock sources for supplementation. Cramer (1995) described similar information in a later genetic resource assessment focusing only on the Selway River, a principle subbasin of the Clearwater. He also recommended a broodstock management plan, which integrated a hatchery and wild spawner component in the natural environment and in the hatchery. Studies evaluating the mainstem Clearwater River as a habitat for fall chinook, and its suitability for supplementation have been conducted by the Nez Perce Tribe in an ongoing BPA funded project (Arnsberg et al 1992, Arnsberg and Statler 1995, Connor 1989, and Connor et al 1990). A predesign plan (Montgomery Watson 1994) provided preliminary hatchery designs, production (growth) schedules and cost estimates for supplementation of spring and fall chinook at various satellite acclimation sites identified in the NPTH Master Plan. Archeological and cultural resource surveys (Lyon 1995) were completed on a number of proposed NPTH sites to comply with state and federal laws prior to design and construction. National Environmental Policy Act (NEPA) analysis began in 1995, and a supplement to the Master Plan was developed just prior in order for NEPA to be completed on an up-to-date proposal. The supplement (Johnson et al 1995) revised the Master Plan in accordance with information generated from the genetic resource assessments, preliminary design, and draft monitoring and evaluation plan. The final NPTH Monitoring and Evaluation plan (Steward 1996) is a comprehensive work to evaluate supplementation by NPTH and addresses those criteria identified by the NPPC for supplementation M&E including: employing an ecosystem approach, assessing ecological risks, identifying critical

uncertainties, focusing on genetic resources, survival, reproductive success and ecological interactions, evaluating cumulative impacts, including baseline biological and habitat surveys, and identifying facilities needed to conduct M&E. The NPTH genetics management plan (Kincaid 1997), developed by a USGS Research Geneticist, will guide mating protocols and brood selection in order to conserve genetic variability of individual stock gene pools and reduce the probability that natural and hatchery fish will diverge genetically over time. The environmental impact statements (BPA et al 1996, BPA et al 1997) disclose the effects of the proposed supplementation actions and facilities on the surrounding environment. Considerable emphasis was paid to effects on co-existing resident and anadromous fish. The EIS also discusses alternatives to actual new facility construction. The Record of Decision for the Final EIS (Robertson 1997) concluded that overall effects on the fish and wildlife communities will be beneficial and that NPTH should be constructed. The Biological Assessments (Powers 1997) and responding Biological Opinion (Stelle 1997) and informal consultation (Ruesink 1997) conclude that implementation of NPTH would not jeopardize species listed or proposed for listing under the Endangered Species Act. The Nez Perce Tribe provided a response (NPT 1997) to questions posed in the Three-Step review process established by the NPPC for ongoing supplementation projects. The response was evaluated by the NPPC "independent scientific review" (PNNL 1997) and found that "…The NPTH has addressed all the questions in the Three-Step process. Every issue raised by the Council and ISRP has been answered".

### b. Rationale and significance to Regional Programs

**Authorizing Measures.** NPTH mitigates for in-place, in-kind losses caused by development of the hydroelectric system in the Pacific Northwest and there are several program measures in the NPPC Fish and Wildlife Plan (NPPC 1994) that relate to it. Measures under 7.4M, Nez Perce Tribal Hatchery, all specifically address the development and construction of NPTH. In addition, NPTH proposes supplementation of fall chinook consistent with Measure 7.5.B.1. NPTH is one of 15 high priority supplementation projects, making it applicable to Measure 7.3.B.2. Program Measure 4.1 addresses doubling salmon and steelhead runs without loss of biological diversity. NPTH supplementation of natural spawning populations would contribute towards this effort with a keen focus on maintaining "…long-term fitness and genetic integrity of targeted fish populations; and keep ecological and genetic impacts to non-targeted fish populations within acceptable limits" (BPA et al 1997). Program measure 7.4F also states, "...as weak stocks or populations of salmon and steelhead are identified and assessed, supplementation will be one option to consider to help rebuild these stocks." Planning for NPTH has identified and assessed weak populations of salmon in the Clearwater and the resulting supplementation is proposed as an option to rebuild these stocks.

NPTH also relates to a number of measures in the Snake River Recovery Plan (NMFS 1995a). Measures under 4.4 (Improving survival of Columbia River Basin anadromous salmonids by improving quality of fish released from hatcheries) are all addressed by rearing techniques proposed for NPTH. Ecological interaction studies described in

Measure 4.5.c. are a focus of NPTH M&E Plan (Steward 1996). And finally, the genetic risk assessments developed for NPTH have researched the origin of the Clearwater runs (as called for in Measure 4.7.d) and identified appropriate stocks to use for supplementation by NPTH.

Wy Kan Ush Me Wa Kush Wit (Nez Perce Tribe et al 1995) recommends implementation of NPTH and production goals are addressed in the Plan. The Clearwater River Subbasin Plan (NPT and IDFG 1990) also recommends completion of NPTH in its efforts to restore natural spawning populations. Recommendations for spring, summer and fall chinook salmon all depend on implementation of NPTH.

**Conceptual Framework** The conceptual foundation for the NPTH program can be stated as: A carefully planned, implemented and monitored artificial propagation program can be used as a tool to restore naturally spawning salmon populations and thereby promote a healthy ecosystem. Further, that the health of the ecosystem upon which the Nez Perce Tribe has relied is based on abundance, not simply a presence, of naturally spawning salmon.

**New Ideas** NPTH offers a number of new ideas and contributions to recovery efforts. The amount of planning is representative of a change in thinking regarding the construction of artificial propagation facilities. The consideration given to the biological affects of this one supplementation program (e.g. genetics resource assessments, supplementation-based broodstock management plan, M&E plan, NEPA assessment and ESA consultation) compares in magnitude to that undertaken for entire basinwide hatchery programs such as the Mitchell Act facilities and the Lower Snake River Compensation Plan hatcheries. The M&E plan for NPTH has been praised for its comprehensive nature and discussion. The Independent Review (PNNL 1997) found that "…The document that best illustrates the NPT commitment to ecologically sound operation is the Monitoring and Evaluation Plan." They found that "…The project assumptions for all issues are clearly stated and documented. The critical uncertainties are listed and risk levels for each uncertainty is documented. Performance criteria variables are listed and explained. Experiments and monitoring plans are explained for every issue. Protocols for these activities are described in the plan." The M&E plan can be an extremely useful prototype for other supplementation efforts undertaken in the Columbia Basin, in addition to being used to guide efforts of the NPTH. Finally, NPTH is the first artificial propagation program in which a group of experts were assembled to integrate NATUREs based strategies into the final design. NATUREs strategies are key to rearing fish with "wild-type" characteristics, thus making the propagation program better fit the goals of supplementing a natural spawning population.

### c. Relationships to other projects

NPTH is closely allied with, dependent upon, and provides support to other Nez Perce Tribal fisheries projects. These include dependency on implementation of watershed improvement projects in Lolo Creek, Eldorado falls, Squaw and Papoose Creek and McComas Meadows (Project # 9607702, #9607704, and # 9607705). These systems are

either scheduled as “treatment” or “control” streams for NPTH and Idaho Salmon Supplementation Studies. Other NPT supplementation projects (Johnson Creek Artificial Propagation Enhancement #9604300, Northeast Oregon Hatchery #8805301 and Pittsburg Landing, Capt. John Rapids, Big Canyon Acclimation Facilities #9801005) will share knowledge on production operations and results from monitoring and evaluation studies with NPTH. The M&E Plan for NPTH (Steward 1996) has already been useful to planning for these supplementation projects by providing a template for similar M&E studies. Results from studies described in the umbrella proposal, Snake River Fall Chinook Salmon Studies, will also be critical to progress of NPTH fall chinook supplementation.

In general, NPTH is dependent on the progress of other hatchery programs in the basin and guidance to hatchery management stipulated under the U.S. v Oregon lawsuit. The NMFS (1995) production cap will affect NPTH spring chinook and coho production. Fall chinook production will support recovery of a listed species. In addition, Section 10 permits will be required for including natural reared fall chinook component into the broodstock spawning protocol. Acquisition of NPTH fall chinook broodstock relies on adults from Lyons Ferry Hatchery and fish released from the Fall Chinook Acclimation facilities (Project #9801005). Rapid River stock sources will be used as a start up for spring chinook supplementation. Thus, coordination with interagency hatchery managers will be required. It is anticipated that NPTH production will be called for in the new U.S. v Oregon Columbia River Fish Management Plan, and that production efforts will be affected by proceedings in that forum. In addition, technology transfer and basinwide coordination of supplementation efforts – including the Hood River Production Program and the Yakima Fisheries Project - will result in improvements to the NPTH annual program.

Importantly, NPTH is dependent upon salmon recovery efforts undertaken in the Columbia River Basin. None of the hatchery or wild stocks stand alone in this aspect. All stocks have declined to dangerously low levels. The gamut of programs designed to address the critical issues of fish passage, especially, will ultimately decide the fate of salmon in the Snake River.

**d. Project history** (for ongoing projects)

The NPTH program has been in the making since 1982 when the NPPC authorized design and construction plans for fish production facilities on the Nez Perce Indian Reservation. Significant planning on the existing NPTH concept began in 1987. Costs to date have been $8,870,673. NPTH was listed in the Northwest Power Planning Council’s 1987 Fish & Wildlife Program (FWP) as Action Item 703 (g)(2) and in the 1994 FWP as item 7.4M. The NPTH program has always been assigned BPA Project Number 8335000 and has included funding and contracting for two different components: the Planning & Predesign, and M&E programs. However, beginning with this fiscal year proposal, the NPTH M&E program will be assigned a separate BPA Project Number, 8335003.

**Major Results**. Over the last 12 years, this program has completed a series of planning, facility design and environmental analysis documents to meet FWP, funding, NEPA, ESA, interagency and public concerns regarding the evolving science of supplementation and its effects on the environment (described in section 8.a., "Finding a Solution"). The final design engineering plans will be completed in 1999, which would allow for construction to finally begin in that year. Completion of this planning process represents a most significant accomplishment for the FWP and the Nez Perce Tribe.

**Adaptive Management**. Adaptive management has been critical concept to the development of NPTH. As each planning document was completed, and a greater amount of information compiled, some amount of revision was required to the original plans. For example, the Supplement to the Master Plan (Johnson et al 1995) was developed to capture major changes to the original Master Plan (Larson and Mobrand 1992) prior to describing the proposed action in the Draft EIS (BPA et al 1996). These included: revision of the goal statements to better reflect the needs and intentions of the NPT; the number and type of chinook produced were revised and some satellite sites were dropped; a "decision tree" was added to NPTH which describes the allocation of chinook to different streams and reaches during years in which escapement either exceeds or falls short of broodstock needs; a number of "control" streams were added to NPTH program to address the M&E design; and finally, the broodstock recommendations and mating protocols were refined in concert with the later genetic resource assessments. The Draft EIS (BPA et al 1996) was submitted for comment and review by a host of interested parties and resulted in further revision of NPTH. The Biological Opinion for NPTH also calls for certain terms and conditions that result in shaping how the program is carried out. Finally, the Final Design and the NPPC review of construction costs will likely result in some changes to the program. These changes all reflect an incremental increase in knowledge, and application to the program consistent with the concept of Adaptive Management.

**Recent Progress**. Much of 1998 has been devoted to the development of a final design (engineering blueprints) which will be completed in early 1999. The company awarded the final design contract, FISHPRO Inc., was selected based on its proven performance providing satisfactory, cost-effective products within timelines, its enthusiasm to implement innovative techniques evolving from recent NATURES experiments, and its highly responsive concern with customer satisfaction. The final design was shepherded by a NATURES Design Team, consisting of interagency experts in fish production and the evolving NATURES rearing strategies. The NATURES Design Team established a set of biological criteria proven to enhance post-release survival to guide development of the engineering designs and then provided recommendations to the final design as it evolved. In 1999, the final design will be submitted to the NPPC as the last step in the Three-Step process. Assuming NPPC approval will be acquired with this third review, construction contracting and construction should commence in 1999 and would be completed in 2001. Although construction will be contracted by BPA directly, NPTH employees will maintain an active role in this aspect of the project during the year 2000.

NPTH will proceed to acquire broodstock for supplementation of spring chinook "treatment streams". Appropriate stock spring chinook were outplanted in NPTH streams in 1993, 1994 and with returns from the 1997 broodyear. These actions were undertaken with the assumption that NPTH would be completed and that returns from the single strong 1997 broodyear should be taken advantage of to establish a brood source for NPTH. Fish were reared for these actions at existing hatcheries, and we intend to take advantage of available potential brood fish that may return in 1999 and the year 2000 similarly. Although returns are predicted to be extremely low for these years, the improved juvenile survival and beneficial progeny:parent return ratio offered by hatcheries justify efforts to survive the broodyear through artificial propagation. Consequently a portion of the program will be devoted to subcontracting rearing space at existing hatcheries and for personnel and supplies needed to care for the fish. In addition to providing protection from cohort collapse, the O&M program has been beneficial in providing Tribal employees considerable on-the-job training caring for fish at other hatcheries.

In 1998, the NPPC recommended an amendment to the NPTH Master Plan to address production of coho salmon. Approval of this amendment initiates the Three-Step process for coho supplementation to occur under the auspices of NPTH. It is anticipated that the Master Plan amendment will be completed in 1999, which will then require the first level of review in the Three-Step process. Should it be determined after master planning, NEPA and final design analysis that NPTH production of coho is desirable, then the existing program would be amended to fund the new production. This proposal is submitted assuming that coho production under NPTH would occur sometime in the year 2000. As with spring chinook, it is anticipated that coho production would take place at existing hatcheries using Tribal employees

### e. Proposal objectives

This section briefly summarizes long-term production and return goals of NPTH in addition to discussing those objectives that apply to the work being proposed for the year 2000. The production and return goals establish a numerical baseline or reference for the program in addition to meeting the suggestion made in the proposal directions. However, the NATURES based supplementation that NPTH calls for will not occur in the immediate future (1999 and 2000). Work proposed in these years is part of the incremental planning activities needed to move the project towards construction and eventual operation.

**Long Term Numerical Production Goals and Returns:**

Production goals: a total of 2,800,000 fall chinook and 768,000 spring chinook will be reared by NPTH. Fall chinook will be released as age 0+ smolts and would be distributed as follows: 1,500,000 at Cherrylane, 500,000 at North Lapwai Valley, 400,000 at Lukes Gulch, and 400,000 at Cedar Flats. Spring chinook will either be direct released as parr or acclimated at the three satellite sites for volitional release as fall pre-smolts. Direct release sites and numbers are as follows: 400,000 at Meadow Creek, 83,000 at Boulder

Creek, and 20,000 at Warm Springs Creek. Acclimated pre-smolt releases are 150,000 at Yoosa/Camp, 75,000 at Newsome Creek and 40,000 at Mill Creek.

Predicted adult returns: 1,452 spring chinook are predicted to return; of these, 646 would be used for brood, 471 for natural production and 335 for harvest. For fall chinook 4,100 adults are expected to return; of these 1,904 would be used for brood, 1,136 for natural production and 1,060 for harvest. Harvest rates for both spring and fall chinook are dependent upon utilization of returning adults according to the "wild:hatchery" spawning protocol.

Returns would contribute towards FWP rebuilding goals as well as delisting goals for fall chinook. The average number of naturally spawning spring chinook in the Clearwater for 1973 – 1994 was about 1,300 adults. Thus, this program would increase that number by about 37%, in addition to providing fish for harvest. The average number of fall chinook returning to the Snake River Basin in the last 10 years has been less than 1,000 adults. This program would result in doubling that number, and in combination with the fall chinook acclimation program, serve towards delisting of the stock.

Survival Rates: Assumptions utilized in modeling returns ultimately depend on an improvement in passage conditions through the Columbia and Snake River reservoirs. The assumed survival rate to smolt for spring chinook released from satellite ponds is 19.5%. This is based on a 65% post-release survival and a 30% overwinter survival. The assumed survival rate to smolt for parr releases is approximately 10%. This is based on a 65% post-release survival, 72% fingerling to parr survival, and a 30% overwinter survival. Fall chinook were assigned a 50% post-release survival. Survival rates were based on information on NATUREs rearing and Idaho Salmon Supplementation Studies (BPA et al 1997). Smolt to adult survival rates for spring and fall chinook were assumed to be similar to those for wild fish and were estimated at approximately 0.5% and 0.15% respectively. These rates are also based the assumption that, through the multitude of recovery actions focused on Columbia Basin salmon, passage will be improved within the next 20 years such that there is at least a stable, non-declining progeny:parent return rate.

**Year 2000** The following summarizes tasks and objectives identified in section 4 of this proposal.

Objective 1. Administration, Coordination and Communication.
This objective consists of a series of tasks intended to accomplish necessary inter and intra-agency communication on M&E issues, production planning, funding, permitting, ESA consultation and reporting requirements. Coordination on cultural resources and their protection will be accomplished through this objective, as will review and participation in forums that affect land management activities proposed on watersheds critical to the NPTH program. In addition, participation in basinwide forums ( U.S. v. Oregon Production Advisory Committee, CBFWA Anadromous Fish Managers, and NPPC ammendement process) will be accomplished through this objective.

Objective 2. Operations & Maintenance.
As construction is completed, we will begin testing and operating the new facilities. The construction contract requires the Construction Manager to develop a facility operations manual. The NPTH Hatchery Manager and Construction Manager will work through the bugs in operating equipment. Under this objective we will also continue spring chinook, and fall chinook production at interim facilities (Kooskia, Clearwater, Dworshak, and Lyons Ferry Hatcheries) for release into NPTH streams and rivers. Assuming that coho salmon planning is completed, coho production would likewise occur at interim facilities. In addition, we will continue "on-the-job" and transitional training of NPTH personnel by rearing and caring for fish at those facilities. These employees will be operating the NPTH facilities as they come on line. Finally, this objective will continue efforts to acquire and maintain broodstock source for spring and fall chinook and coho salmon at Lower Granite Dam and at state and federal hatcheries.

Objective 3. New Construction of NPTH facilities
NPTH Hatchery Manager and Production Director will monitor construction to determine that NATURES biological criteria, as established in Final Design, are being incorporated into the facility. They will also participate, with BPA project administration and the Construction Manager, in oversight of facility construction at the Cherrylane CIRF, Sweetwater Springs CIRF, Yoosa/Camp and Cedar Flats satellite facilities and the Meadow Creek weir and in scheduling facility construction in 2001 at Newsome Creek, Mill Creek, Luke's Gulch, and North Lapwai Valley satellite facilities. This objective also includes a subcontract for a cultural resource specialist to provide for cultural resource mitigation during construction of facilities.

Objective 4. Project Planning
This objective provides for refining hatchery production and NATURES rearing methods based on evolving information in the field and monitoring and evaluation results from initial, experimental outplants. In addition, we will also continue planning necessary (Master Plan, NEPA, biological assessment, facility design and Three-Step process) to evaluate incorporation of coho salmon restoration strategy into NPTH.

## f. Methods

Methods for accomplishing the year 2000 objectives in Section 8e. are rather self-explantatory and described sufficiently in the text above. In addition, hatchery production operations occurring at existing facilities in the year 2000 are not expected to differ from standard operating procedures. However, the following presents discussion on the methods intended to accomplish the overall production strategies of NPTH when it is operational. NPTH has been designed with considerable innovation and this summary, excerpted from the Final EIS (BPA et al 1997), describes these operations.

The NPTH would use innovative rearing techniques that have not been used as standard methods by other hatchery programs in the Columbia River Basin. Incubation and rearing water temperatures, rearing containers, rearing densities, release strategies, and broodstock management are different from those conventionally used in most facilities.

The NPTH has three phases. Phase I (1- 5 yr.) would begin outplanting efforts to re-establish naturally spawning salmon. Broodstock would be obtained from selected hatchery stocks identified in the programs genetic risk assessments. Phase II (6 -10 yr.) would continue the effort using those returning adults to increase and stabilize production in project streams. Phase III (11 - 20 years) will create opportunities for harvest, and would use adaptive management for specific actions based on the success of the first and second phase. Location and description of facilities included in NPTH are presented in Section 8g., Facilities and Equipment.

Spring chinook would be reared at the Cherrylane CIRF until they are fingerling size. A portion of these fish will be outplanted as fingerlings in early summer into three different streams. The remaining spring chinook will be moved to acclimation ponds on three other streams to be reared until autumn when they will be volitionally released as presmolts. This fall release timeframe corresponds to the migratory pulse that occurs naturally in Idaho's spring chinook populations. It is stimulated by decreasing day lengths and cooler water temperatures and appears to be related to chinook seeking more favorable overwinter conditions in the mainstem rivers (NPT, 1996). The release strategy would increase survival during the growing season, reduce competition among hatchery and wild fish for limited food resources, and better prepare pond-reared fish for living under natural conditions following their release. The spring chinook would then migrate downstream during spring of the following year.

Fall chinook would be reared at the Cherrylane and Sweetwater Springs CIRFs until they reach fingerling size. Half of the fish would be moved to acclimation rearing ponds within the Cherrylane CIRF, and half would be moved to three acclimation sites. They would be reared and imprinted on that source of water for 1-4 months prior to being released in early summer. Fall chinook are also expected to begin their seaward migration shortly after release.

NPTH releases would occur over a large geographic area to maximize the use of available rearing habitat in the Clearwater Subbasin and to avoid overwhelming local anadromous and resident fish populations. Releases of fall chinook would occur in the mainstem lower Clearwater River and 60-90 miles upstream in the Selway and South Fork Clearwater Rivers. Spring chinook would be released in several smaller tributaries of the mainstem Clearwater, Lochsa, Selway and South Fork Clearwater rivers.

The number of hatchery fish released would be limited so that, when added to the number of wild chinook, the total would not exceed the amount of habitat available for that species. Each year, numbers for release would be recalculated, based on the results of the M&E program, to avoid exceeding the stream's carrying capacity. All fish released would be marked for M&E and broodstock management purposes.

Temporary weirs, traps and seines would be used to count and capture returning adult salmon. Some adults would be used for broodstock; the remainder would be returned to the stream to be harvested or to spawn naturally. The genetic management plan (Kincaid

1997) will guide mating protocols and brood selection in order to conserve genetic variability of individual stock gene pools and reduce the probability that natural and hatchery fish diverge genetically over time.

Water temperatures in incubation and rearing containers would be controlled to best suit supplementation goals. Fall chinook would require an accelerated incubation and growth schedule to produce mature subyearling smolts in May and June. Naturally-produced subyearling smolts in the Clearwater River grow slowly in the cold river water and typically do not emigrate until July or August when lower Snake River flows and dam passage conditions are not as beneficial to their downstream migration. NPTH fall chinook subyearling smolts would be programmed to grow to a mature size sooner using the warmer groundwater. They would then be of a suitable size to migrate in June when flow through the Snake and Columbia River hydrosystem is currently managed to benefit fish survival.

Spring chinook will be incubated and reared in water that approximates the temperature regime of the streams where fish would eventually be released. This stock of chinook spends more time rearing in the Clearwater than do the subyearling migrants, and their natural emigration dates correspond to periods when hydrosystem operation facilitates passage. Consequently, temperatures in their rearing environment will be controlled to maintain growth rates consistent with those in their receiving streams.

During final rearing, the fish will be kept in ponds designed and operated to simulate natural conditions. Ponds would be designed without hard, straight lines. Artificial features such as undercut banks, logs and other structures would be placed in the ponds and fish would have a place to hide and learn to avoid predators. Exposing the fish to bird and fish predators secured in the ponds would induce predator response. Human activity around the ponds would be discouraged, and shading and overspray will be used to obscure overhead vision. Shading would also moderate warm summer water temperatures. Underwater feeding options would be pursued to avoid conditioning young fish to be fed by humans. Water flows in ponds would be increased to exercise and build physical stamina of fish to adapt to stream or river conditions following release.

Recent literature reviews and experiments have shown improvements in post-release survival by fish reared using these novel techniques. Maynard, et al. (1995) conducted a review of semi-natural culture strategies for enhancing the post release survival of anadromous salmonids. They discuss the difference in post release survival of fish reared in semi-natural and conventional hatchery settings and found that fish reared in earthen ponds and in tanks with substrate, cover, and instream structure had better cryptic coloration for the stream environment into which they were released than did fish reared in barren gray tanks, similar to the surroundings in conventional raceways.

Fish would be reared at relatively low densities. NMFS (1995) describes problems in rearing fish at high densities such as increased disease and post-release mortality. They recommend that fish be reared at a density that does not exceed 9.6 $kg/m^3$. NPTH will rear fish at a density that is a third as much and should impart economic efficiency to the

hatchery and enhanced survival to NPTH fish. Lower rearing densities will also provide a means for reducing temperature-induced stress during the warmer summer periods.

Fish released directly into stream and pre-smolt releases would sustain higher mortality than fish reared in a conventional hatchery for the same period of time. Hatcheries offer control over environmental conditions to a great extent, allowing survival to be high. However, hatchery fish sustain considerable mortality following release into the river. This is understandable since they have had no chance to develop the natural behaviors that allow them to survive. The NPTH release strategy is designed to focus on producing more fit fish by subjecting them to environmental conditions for more of their lives. In the end, the strategy may even be more cost-effective than conventional hatcheries because the cost of raising fish for 6 months to 1 year longer in the hatchery may not be justified by increased returns.

### g. Facilities and equipment

NPTH production facilities will consist of two Central Incubation and Rearing Facilities (CIRFs) and six satellite acclimation sites. The two CIRFs, which will provide incubation and early rearing, will be located at Cherrylane in the lower mainstem Clearwater and at Sweetwater Springs, a tributary to Lapwai Creek. There will be three satellite facilities (acclimation/release and adult holding) for fall chinook; at Lukes Gulch on the lower South Fork Clearwater, Cedar Flats on the lower Selway River and North Lapwai Valley near the mouth of the Clearwater River. In addition, fall chinook will also be acclimated and released from the Cherrylane CIRF itself. There will be three satellite sites for spring chinook; at Yoosa/Camp on upper Lolo Creek which is a tributary to the mainstem Clearwater, at lower Newsome Creek and lower Mill Creek, both tributaries of the South Fork Clearwater. Three wilderness streams, Boulder Creek and Warm Springs Creek on the Lochsa and Meadow Creek on the Selway, will also be the sites for direct release, helicopter plants of spring chinook parr.

Special NATURES components of the facilities are:

- Incubation units that allow isolation of each mated pair of fish for disease segregation.
- Controlled incubation and early rearing temperatures which mimic natural stream temperatures and incorporates diurnal fluctuations.
- Reduced density rearing with a density index of less than 0.1 for fish larger than 200/lb. In some instances the density index is less than 0.05.
- Modified habitat for rearing fish consisting of: substrate and mottled coloration in containers to enhance cryptic coloration, shading, floating and in water column structures, velocity training (1-2 body length/second), predator avoidance training with birds and large fish, overspray, varied depth, natural foods, and limited human visual contact.
- Rearing containers designed to reduce stress based on each species need. For example; shape and habitat variety are incorporated in the NATURES “S-design”. Depths greater than 4 feet for both juveniles and adults. Circular containers for

increased velocity or periodic velocity pumping to provide exercise conditioning 2-4 hours per day for 12 weeks prior to release.

- Water sources and facility locations in habitats upstream of natural reproduction and rearing river and stream reaches for the purpose of imprinting adults to return to historic reaches of river or stream.
- Design flexibility that will allow production management modifications of rearing technology to respond to monitoring evaluations to enhance post release survival.

Final Design engineering drawings will be completed and submitted to NPPC in spring of 1999. The production headquarters for NPTH will be located at the Cherrylane CIRF, while other facilities are principally designed for temporary use during acclimation, trapping and holding periods. Suitable field equipment, vehicles, laboratory and office space and equipment, life support systems for organisms will be provided. Most transport vehicles, heavy equipment and storage has already been purchased.

**h. Budget**

Nez Perce Tribal Hatchery is in a transition mode; 1998-99 time calendar year will see the implementation of a final design, its completion, NPPC Step 3 approval, construction implemented, operations and maintenance functions for the production of fish, both juveniles and adults, and the training of personnel for future NPTH operations. In addition, the project is the umbrella for its own monitoring and evaluation program, Project #8335003, and assists other projects through sharing equipment and personnel; e.g., the Fall Chinook Acclimation Project Numbers (Project #9801005, #9801007, #9801008) and NPT habitat projects (Project # 9607702, #9607704, #9607705). The NPTH budget utilizes management personnel oversite in Northeast Oregon Master Plan (Project #8805301) and Lostine Weir (Project #9800702).

**Personnel:** Support provides the following personnel;

* Program administration: Program Manager and Contract representative 11% FTE each. These persons work across all projects funded under the Master Agreement with BPA.

* Project Management: Project leader and Project Coordinator 54% FTE, Hatchery Supervisor 75% FTE, Assistant Hatchery Manager 100% FTE. These persons provide direct management support to NPTH Project #8335000, #8335001(Final Design), #8335050 (NEPA/FEIS) and four other NPT Production projects funded by BPA; #8805301, #9800702, #9604300, #9801005/007/008 and NPTH monitoring and evaluation #8335003. In addition, NPTH tribal personnel provide labor to raise fish at state and federal hatcheries.

* Administative support: Admin. Assistant and Secretary 100% FTE. These persons provide support for four NPT Production projects funded by BPA; #8805301, #9800702, #9604300, #9801005/007/008, and #83350003.

* Technical Assistants: seven persons at 100% FTE; eight persons at 54-65% FTE; four college interns at 45% FTE. These persons are a labor force shared with at least three other NPT Production projects; ; #8805301, #9800702, #9801005/007/008, and #83350003.

* Conservation enforcement support has become a portion of this and other projects supported under the Master Agreement with BPA.

**Fringe Benefits:** Rates of 24% to 14% cover several groups of personnel; 1) regular full-time employees and regular part-time employees; 2) temporary full-time and temporary part-time employees; and 3) seasonal employees who receive different amounts of benefits depending on empoyment status and preference for tax exempt status. Benefits are subject to change by employer and employee.

**Supplies and Materials:** Two categories are covered, supplies and materials. Some examples are; fish food, chemicals, lumber, tools, safety clothing, test kits, rope, expendable equipment, uniforms, medication, etc.

**Operations and Maintenance:** Categories covered by this line item include; training, utilities, rent, repair, maintenance, vehicles, and leases. For example under vehicles we fund GSA vehicle lease, mileage, and repair and and the operation, maintenance and repair of BPA purchased vehicles.

**Capital Acquisitions:** Two catagories are covered; 1) equipment for $39,000 and 2) construction cost estimate based on the 30% design review. The construction estimate, $17,562,000 covers development of 8 facilities during their second year of construction. Construction will begin in 1999 and could be extended through 2004; if this occurs, then cost per year for construction could be dispersed over that time frame reducing the annual expenditures. However, commitment to the entire cost of capital construction will be needed in 1999 regardless of total cost. Total cost will not be available until 100% final design is completed in March or April 1999. It is anticipated that this estimate will be reduced as the project reaches 100% final design and two Value Engineering studies are utilized to refine facility costs in accord with the NATURES design.

**NEPA Costs:** While the Final EIS was completed in 1997, Project #8335050, modification of the FEIS document could be needed to address changes in construction, additional species, Endangered Species Act, or cultural resource mitigation encountered during construction. For this reason, $50,000 was added to the budget.

**Construction Related Support:** The relative value of this item is based on the 30% design review and is a about 2/3 portion of the total amount predicted. It is anticipated that this estimate will be reduced as the project reaches 100% final design and two Value Engineering studies are utilized to refine facility costs in accord with the Nature's design.

**PIT TAGS:** This former project cost has now been allocated to NPTH monitoring and evaluation, Project 8335003.

**Travel:** Administrative and management personnel travel primarily to Portland, Seattle, and Boise to coordinate and develop this project with NPPC, BPA, US V. Oregon, CRITFC, BIA, NMFS, USFWS, WDFW, ODFW, IDFG, Engineering cosultants and other consultants. This line item also supports other staff travel as necessary to complete operational responsibilities and training.

**Indirect Rate:** The indirect rate is based on the current 1998 figure of 22.9% and is subject to change annually in accordance with the OMB.

**Subcontracts:** Five subcontract types are anticipated;

1) Helicopter transport for fish and personnel which have been implemented since supplementation began in 1993,
2) Contract facilitation with R.H. Sampsel to resolve recurrent government to government issues that arise.
3) Interim fish culture support at state and federal hatcheries; IDFG Clearwater Hatchery and USFWS Dworshak/Kooskia Hatchery and ODFW Lookingglass/Walla Walla Hatcheries and WDFW Lyons Ferry Hatchery for juvenile and adult production. Anticipated production for this year is 300K coho smolts, 450K coho parr, 500K spring chinook smolts, 250K fall chinook age-1+ smolts, and 500K fall chinook age-0 smolts. Tribal personnel provide labor to rear fish at state and federal hatcheries.
4) Anticipated NEPA modifications that may need to occur as a result of additional species added to production, Endangered Species Act adaptions, or cultural resource mitigation encountered during construction. For this reason, $50,000 was added to the budget. This expense was separated from "subcontracts" in Section 5.
5) Cultural Resource mitigation that may occur during construction.

## Section 9. Key personnel

**Roy Edward Larson, Director of Production (0.5 FTE)**
Nez Perce Tribe Department Fisheries Resource Management

EDUCATION
M.S. in Veterinary Science, University of Idaho, 1972
B.S. in Agriculture, University of Idaho, 1970

PUBLICATIONS

1. Larson, R.E. and Mobrand, L. 1992. Nez Perce Tribal Hatchery Master Plan and appendices. Bonneville Power Administration. Project No. 83-350. Contract No. DE-AI79BP36809.
2. Larson R.E. and Jose, J.R. 1988. A report of the 1987 - 88 mid-winter supply survey for the Nez Perce Tribe's low capital low technology anadromous salmonid hatchery project: 83-350 BPA agreement No. DE-AI79BP36809.
3. Klontz, G.W., Chacko, A.J. and R.E. Larson. 1979. Epidemiology of respiratory diseases in juvenile spring chinook salmon. University of Idaho, Fisheries Resources, College of FWR Sciences Bulletin.

4. Larson, R. E. 1977. Kelp meal as a diet supplement for salmonids. Proceedings of 38th Northwest Fish Culture Conference, p. 28.
5. Dulin, M.P., Huddleston, T., Larson, R.E. and Klontz G.W. 1976. Enteric Redmouth Disease. University of Idaho, Fisheries Resources, College of FWR Sciences Bulletin.

TECHNICAL EXPERIENCE

- Production Director - Nez Perce Tribe Lapwai, ID Oct 1990 - Present. Nez Perce Tribal Hatchery, North East Oregon Hatchery, Johnson Creek Supplementation Project, Fall Chinook Acclimation Facilities, Sturgeon Research, Early Action Watershed Projects.
- Production Biologist - Nez Perce Tribe Lapwai, ID Sept 1987 - Sept 1990. Nez Perce Tribal Hatchery, Imnaha Master Plan, Subbasin Planning
- Licensed General Contractor - Private Business, Sitka AK Oct 1984 - Sept 1987
- Hatchery Manager - Northern Southeast Regional Aquaculture Association, Sitka AK, Sept 1980 - Oct 1984. Medvedjie Central Incubation and Rearing Facility for spring chinook, chum and coho salmon.
- Project Leader - Northern Southeast Regional Aquaculture Association, Juneau AK, Apr 1980 - Sept 1980. Salmon Creek Central Incubation and Rearing Facility for pink, chum and coho salmon.
- Research Technician I - University of Idaho Fish Disease Lab, Moscow ID Jul 1976 - Apr 1980. Fish health management and fish disease diagnostics

Duties: Provide direction, supervision and management of NPT Fisheries Production program. Co-author Nez Perce Tribal Hatchery Master Plan and Imnaha Master Plan. Responsible for integrating production needs into the multi-species recovery and restoration program of the Nez Perce Tribe. Write proposals for funding. Coordinate project development, production and ESA issues with State, Tribal and Federal agencies. Contract supervision on NPT Fisheries Production projects.

Skills: Twenty three years of experience managing fish culture, fish health, multiple species and innovative supplementation techniques to restore and recover weak or endangered species. Eleven years experience developing the Nez Perce Tribe anadromous and resident fish production programs and coordinating tribal production activities under the Northwest Power Planning Act. Fifteen years experience developing and overseeing contracts for various funding agencies. Twenty two years of experience supervising technical and professional fisheries staff.

**Grant W. Walker, Hatchery Manager (0.75 FTE)**
Nez Perce Tribe Department Fisheries Resource Management

EDUCATION
Intensive Aquaculture Training, Clearwater Marine, Ltd. Isle of Mann, U.K., 1987.
B.A. in Biological Science, University of New Orleans, LA, 1981.

TECHNICAL EXPERIENCE

- Nez Perce Tribal Hatchery Manager - Nez Perce Tribe Lapwai, ID. Apr 1990 - Present. Nez Perce Tribal Hatchery, North East Oregon Hatchery, Johnson Creek Supplementation Project, Fall Chinook Acclimation Facilities.
- Hatchery Manager - Ocean Products Inc., East Machias, ME. Apr 1988 - Sept 1989. Gardner Lake Hatchery, Atlantic salmon.
- General Manager - Kentrout Ltd., Timau, Kenya, East Africa. 1982 - 1988. Hatchery management, consultant on aquaculture programs.
- Buyer/Restorer/Salesman - The Mariner, Inc. New Orleans, LA. 1981 - 1982. Marine antiques, marketing and promotion.
- Supervisor - X-ray and Laboratory - Medical Center of Calico Rock, AR. 1974 - 1977.

Duties: Provide direction, supervision and management for NPTH Final Design and Construction and hatchery operation. Responsible for integrating tribal production needs into the NPTH design. Project coordinator for the NATURE's Design Team. Provide tribal supervision and administration for contracts let under the NPTH program. Responsible for quarterly and annual reports for NPTH. Coordinate project development, production and ESA issues with State, Tribal and Federal agencies.

Skills: Sixteen years of experience managing fish culture, fish health, using limited resources in highly diverse geographic and cultural settings. Seven years experience working specifically on development of the Nez Perce Tribal Hatchery program. Fifteen years experience developing and overseeing contracts for various funding agencies. Fifteen years of experience supervising technical and professional fisheries staff.

**David B. Johnson, Production Coordinator (0.5 FTE)**
Nez Perce Tribe Department Fisheries Resource Management

EDUCATION
M.S. in Biology, Northern Arizona University, 1982
B.S. in Biology, Northern Arizona University, 1979

PUBLICATIONS

1. Johnson, D.B. and S. Sprague. 1996. Preliminary monitoring and evaluation results for coho salmon outplanted in the Clearwater River subbasin, Idaho, 1995. Nez Perce Tribe Department of Fisheries Resources Management, Lapwai, Idaho.
2. Johnson, D.B., R.E. Larson and C. Steward. 1995. Supplement to the Nez Perce Tribal Hatchery Master Plan. Department of Fisheries Resources Management, Nez Perce Tribe, Lapwai, Idaho.
3. Johnson, D.B. 1990. Indian Tribes of the Northern Region: A brief history, description of hunting and fishing treaty rights and fish and wildlife management programs. U.S.D.A. Forest Service, Northern Region Office, Missoula, Montana.
4. Murphy, P.K. and D.B. Johnson. 1990. Nez Perce Tribal review of the Clearwater River Lower Snake River Compensation Plan. Department of Fisheries Resources Management, Nez Perce Tribe, Lapwai, Idaho.

5. Johnson, D.B. 1987. Preliminary assessment and selected reference information for the proposed Zuni Pueblo warmwater fish hatchery. Report submitted to the Zuni Agency.

TECHNICAL EXPERIENCE

- Production Coordinator - Nez Perce Tribe Lapwai, ID Oct 1997 - Present. Nez Perce Tribal Hatchery, North East Oregon Hatchery, Johnson Creek Supplementation Project
- Senior Monitoring and Evaluation Biologist - Nez Perce Tribe, Lapwai ID Oct 1993 - Oct 1997. Nez Perce Tribal Hatchery
- District Fish Biologist - North Fork Ranger District, Clearwater National Forest, Orofino, ID. May 90 - Oct 1993. Staff leader for fish, wildlife and watershed programs.
- Assistant to Fisheries Program Manager - US Forest Service, Northern Region, Regional Office, Missoula, MT. Jan 1989 - May 1990. Snake River Basin Adjudication, technology transfer.
- Area Fisheries Biologist - Bureau of Indian Affairs, Albuquerque Area Office, Albuquerque NM. Mar 1987 - Dec 1988. Technical assistance in fisheries to 14 Indian Tribes.
- Fisheries Biologist - Nez Perce Tribe, Lapwai, ID. May 1984 - Mar 1987. Stream surveys, steelhead ecology, production planning.

Duties: Assist in developing departmental direction, project and budget development and coordination, contract and subcontract review, report writing, NEPA document preparation, personnel supervision, tribal representation in meetings with interagency quorums, and private consultants, public speaking and presentations.

Skills: Sixteen years of experience conducting field work, and providing management direction on fisheries and watershed projects. Responsible for providing and coordinating analysis of effects, including hatchery production, on aquatic habitat and biota sufficient to meet NEPA and ESA requirements. Responsible for overseeing development and completion of NPTH M&E Plan. Eleven years of experience working in the Snake River basin, specifically in the Clearwater Subbasin, on issues related to hatchery and natural production, interagency coordination, ESA, and Nez Perce Tribal fishing rights.

## Section 10. Information/technology transfer

Technical information will be distributed through quarterly and annual progress reports to BPA, submittal of findings to scientific journals, LSRCP program review workshops, CBFWA Project Review Workshops, Section 10 Permit Reports, Biological Assessments, Biological Opinions, NEPA documents, Brood Year Production Reports, Final Design Reports, and Construction Memorandums. Project cooperators meet regularly to exchange information and discuss project adaptations.

## Congratulations!